What is claimed is:

1. A manufacturing process of a semiconductor device, comprising:

(a) selectively forming a first insulating film in a semiconductor substrate;

(b) forming a first conductor piece over the surface of the semiconductor substrate via a second insulating film,

(c) forming a semiconductor layer in the semiconductor substrate in a region wherein the first insulating film and the first conductor piece do not exist;

(d) forming a third insulating film to cover the first conductor piece, semiconductor layer and first insulating film;

(e) forming a fourth insulating film over the third insulating film;

(f) forming a first opening in the fourth and third insulating films,

(g) forming a second conductor piece in the first opening; and

(h) forming a fifth insulating film over the fourth insulating film,

wherein the third and fifth insulating films are silicon nitride films formed by plasma CVD, and wherein the third insulating film is formed at a temperature higher

than that of the fifth insulating film.

2. A manufacturing process of a semiconductor device according to claim 1, wherein the first and fourth insulating films are silicon oxide films, and the step for forming a first opening comprises a step of etching the fourth insulating film under conditions permitting a larger etching amount of the fourth insulating film than that of the third insulating film and a step of etching the third insulating film under conditions permitting a larger etching amount of the third insulating film than that of the first insulating film.

3. A manufacturing process of a semiconductor device according to claim 1, wherein the fifth insulating film is formed using an ammonia-containing reaction gas, while the third insulating film is formed using an ammonia-free reaction gas.

4. A manufacturing process of a semiconductor device according to claim 1, further comprising, between the steps (c) and (d), a step of forming a silicide layer over the surface of the semiconductor layer.

5. A manufacturing process of a semiconductor device according to claim 4, wherein the second conductor piece contains a first conductor layer and a second conductor layer, and wherein the first conductor layer is thinner than the second conductor layer and lies below the second

conductor layer.

6. A manufacturing process of a semiconductor device according to claim 1, further comprising, between the steps (g) and (h),

(i) forming a third conductor piece; and

(j) connecting, in a second opening formed in the fifth insulating film to expose a portion of the third conductor piece, the third conductor piece with an externally connecting conductor piece.

7. A manufacturing process of a semiconductor device according to claim 1, wherein the first conductor piece is formed of a boron-containing silicon layer.

8. A manufacturing process of a semiconductor device according to claim 1, wherein the conductor piece is formed of three conductor layers, that is, a first conductor layer made of silicon, a second conductor layer and a third conductor layer made of a refractory metal.

9. A manufacturing process of a semiconductor device comprising:

(a) selectively forming a first insulating film in a semiconductor substrate;

(b) forming a first conductor piece over the surface of the semiconductor substrate via a second insulating film,

(c) forming a semiconductor layer in the semiconductor

substrate in a region wherein the first insulating film and the first conductor piece do not exist;

(d) forming a third insulating film to cover the first conductor piece, semiconductor layer and first insulating film;

(e) forming a fourth insulating film over the third insulating film;

(f) forming a first opening in the fourth and third insulating films,

(g) forming a second conductor piece in the first opening; and

(h) forming a fifth insulating film over the fourth insulating film,

wherein the third and fifth insulating films are silicon nitride films formed by plasma CVD, and wherein the third insulating film has a hydrogen content smaller than that of the fifth insulating film.

10. A manufacturing process of a semiconductor device, comprising:

(a) forming a first insulating film over a surface of a semiconductor substrate;

(b) forming a second insulating film over the first insulating film;

(c) forming an opening in the second and first insulating films;

(d) forming a conductor layer in the opening;

(e) forming a third insulating film over the conductor layer,

wherein the first insulating film and the third insulating film are silicon nitride films formed by plasma CVD, and wherein the first insulating film is formed at a temperature higher than that of the third insulating film.

11. A manufacturing process of a semiconductor device, comprising:

(a) forming a first insulating film over a surface of a semiconductor substrate;

(b) forming a second insulating film over the first insulating film;

(c) forming an opening in the second and first insulating films;

(d) forming a conductor layer in the opening;

(e) forming a third insulating film over the conductor layer,

wherein the first insulating film and the third insulating film are silicon nitride films formed by plasma CVD, and wherein the first insulating film has a hydrogen content smaller than that of the third insulating film.

12. A manufacturing process of a semiconductor device, comprising:

(a) selectively forming a first insulating film in a

semiconductor substrate;

(b) forming a semiconductor layer in the semiconductor substrate in a region wherein the first insulating film does not exist;

(c) forming a refractory metal silicide layer over the surface of the semiconductor layer;

(d) forming a second insulating film to cover the refractory metal silicide layer and the first insulating film;

(e) forming a third insulating film over the second insulating film;

(f) forming an opening in the third and second insulating films, and

(g) forming a conductor piece in the opening,

wherein the second insulating film is a silicon nitride film formed by plasma CVD at 400°C or greater.

13. A manufacturing process of a semiconductor device according to claim 12, wherein the second insulating film is formed using a reaction gas having monosilane and nitrogen but not having ammonia.

14. A manufacturing process of a semiconductor device according to claim 12, wherein the third insulating film is a silicon oxide film, and wherein the opening forming step comprises a step of etching under conditions permitting a larger etching amount of the third insulating film relative

to the second insulating film and a step of etching under conditions permitting a larger etching amount of the second insulating film relative to the first insulating film.

15. A manufacturing process of a semiconductor device according to claim 12, wherein the silicide-layer forming step further comprises:

(h) depositing a refractory metal film over the semiconductor layer and first insulating film;

(i) heat treating the semiconductor substrate, thereby forming a silicide layer over a surface of the semiconductor layer; and

(j) removing the refractory metal film over the first insulating film.

16. A manufacturing process of a semiconductor device according to item 12, wherein the conductor piece contains a first conductor layer and a second conductor layer, and wherein the first conductor layer is thinner than the second conductor layer and lies below the second conductor layer.

17. A manufacturing process of a semiconductor device according to claim 16, wherein the first conductor layer is a titanium nitride layer, while the second conductor layer is a tungsten layer.

18. A manufacturing process of a semiconductor device, comprising:

(a) selectively forming a first insulating film in a semiconductor substrate;

(b) forming a first conductor piece over the surface of the semiconductor substrate via a second insulating film,

(c) forming a semiconductor layer in the semiconductor substrate in a region wherein the first insulating film and the first conductor piece do not exist;

(d) forming a third insulating film to cover the first conductor piece, semiconductor layer and first insulating film; and

(e) forming a fourth insulating film over the third insulating film,

wherein the first conductor piece is a boron-containing silicon film, and wherein the third insulating film is a silicon nitride film formed by plasma CVD at 400°C or greater.

19. A manufacturing process of a semiconductor device according to claim 18, wherein the third insulating film is formed using a reaction gas having monosilane and nitrogen but not having ammonia.

20. A manufacturing process of a semiconductor device, comprising:

(a) forming a first insulating film over a semiconductor substrate;

(b) forming a second insulating film over the first insulating film;

(c) forming an opening in the second and first insulating films; and

(d) forming a conductor layer in the opening,

wherein the first insulating film is a silicon nitride film formed by plasma CVD at 400°C or greater.

21. A manufacturing process of a semiconductor device according to claim 20, wherein the second insulating film is a silicon oxide film.

22. A manufacturing process of a semiconductor device according to claim 20, wherein the conductor-layer forming step comprises forming a first conductor layer as a lower layer and a second conductor layer as an upper layer, wherein the second conductor layer is made of copper, and wherein the first conductor layer serves to prevent diffusion of copper.

23. A manufacturing process of a semiconductor device, comprising:

(a) depositing, via a first insulating film, a first conductor layer made of silicon, a second conductor layer, a third conductor layer made of a refractory metal and a second insulating film over a semiconductor substrate;

(b) processing the second insulating film, and third, second and first conductor layers into a predetermined

pattern; and

(c) forming a third insulating film over the second insulating film,

wherein the second insulating film is a silicon nitride film formed by plasma CVD at 400°C or greater.

24. A manufacturing process of a semiconductor device according to claim 23, wherein the third insulating film is a silicon nitride film formed by plasma CVD at 400°C or greater.

25. A semiconductor device, comprising:

(a) a semiconductor substrate,

(b) a first insulating film selectively formed in the semiconductor substrate;

(c) a first conductor piece formed over the surface of the semiconductor substrate via a second insulating film,

(d) a semiconductor layer disposed between the first insulating film and first conductor piece in the semiconductor substrate;

(e) a third insulating film formed over the first conductor piece, first insulating film and semiconductor layer;

(f) a fourth insulating film formed over the third insulating film;

(g) a second conductor piece formed in the opening made in the third and fourth insulating films; and

(h) a fifth insulating film formed over the second conductor piece,

wherein the third and fifth insulating films are silicon nitride films formed by plasma CVD, and wherein the third insulating film has a hydrogen content smaller than that of the fifth insulating film.

26. A semiconductor device according to claim 25, wherein the second conductor piece contains a first conductor layer and a second conductor layer, and wherein the first conductor layer is thinner than the second conductor layer and lies below the second conductor layer.

27. A semiconductor device according to claim 26, wherein the first conductor layer is a titanium nitride layer, and wherein the second conductor layer is a tungsten layer.

28. A semiconductor device according to claim 25, wherein a refractory metal silicide layer is formed over the surface of the semiconductor layer.

29. A semiconductor device according to claim 25, wherein the first conductor piece is formed of a boron-containing silicon layer.

30. A semiconductor device comprising:

(a) a semiconductor substrate;

(b) a first conductor piece formed over the semiconductor substrate via a first insulating film;

(c) a second insulating film formed over the first conductor piece, and

(d) a third insulating film formed over the second insulating film, wherein the second and third insulating films are silicon nitride films formed by plasma CVD, and wherein the second insulating film has a hydrogen content smaller than that of the third insulating film.

31. A semiconductor device according to claim 30, further comprising:

(e) first and second conductor regions disposed on opposite ends of the first conductor piece on the surface of the semiconductor substrate,

wherein the first conductor piece functions as a gate of a transistor, wherein the first and second semiconductor regions function as source and drain of the transistor, respectively, and wherein the second insulating film has a substantially equal width with the first conductor piece in a direction from the source toward the drain.

32. A semiconductor device according to claim 30, further comprising:

(e) a second conductor piece formed over the second insulating film; and

(f) an externally connecting conductor piece connected to the second conductor piece,

wherein the third insulating film has an opening and

in the opening, the externally connecting conductor piece is connected with the second conductor piece.

33. A semiconductor device comprising:

(a) a semiconductor substrate;

(b) a first conductor piece formed via a first insulating film over the semiconductor substrate and having a side wall;

(c) a second insulating film formed over the side wall of the first conductor piece; and

(d) a third insulating film formed over the first conductor film,

wherein the second and third insulating films are silicon nitride films formed by plasma CVD, and wherein the second insulating film has a hydrogen content smaller than that of the third insulating film.

34. A semiconductor device according to claim 33, further comprising:

(e) a second conductor piece formed over the second insulating film; and

(f) an externally connecting conductor piece connected with the second conductor piece,

wherein the third insulating film has an opening, and wherein, in the opening, the externally connecting conductor piece is connected with the second conductor piece.

35. A semiconductor device comprising:

(a) a semiconductor substrate;

(b) a first insulating film over the semiconductor substrate;

(c) a second insulating film over the first insulating film,

(d) a first conductor piece formed in a first opening made in the first and second insulating films;

(e) a third insulating film over the first conductor piece,

(f) a second conductor piece over the third insulating film, and

(g) a fourth insulating film over the second conductor piece,

wherein the first and fourth insulating films are silicon nitride films formed by plasma CVD, and wherein the first insulating film has a hydrogen content smaller than that of the fourth insulating film.

36. A semiconductor device according to claim 35, further comprising:

(h) an externally connecting conductor piece connected with the second semiconductor piece,

wherein the fourth insulating film has a second opening, and wherein, in the second opening, the externally connecting conductor piece has been connected with the

second conductor piece.

37. A semiconductor device according to claim 36, wherein the second insulating film is a silicon oxide film.

38. A manufacturing process of a semiconductor device according to claim 12, further comprising, between the steps (a) and (b),

forming a first conductor piece made of a silicon material, wherein a refractory metal silicide layer is formed on the surface of the first conductor piece in the step (c).

39. A semiconductor device according to claim 25, wherein the first conductor piece is made of a silicon material, and wherein a refractory metal silicide layer has been formed over the surface of the first conductor piece.

40. A manufacturing process of a semiconductor device which comprises forming a first silicon nitride film for self alignment processing and forming a second silicon nitride film for passivation, wherein the first silicon nitride film is formed by plasma CVD using a raw material gas having silane and nitrogen, and wherein the second silicon nitride film is formed by plasma CVD using a raw material gas having silane, ammonia and nitrogen.

41. A manufacturing process of a semiconductor device according to claim 40, wherein the first silicon nitride film is formed at a temperature higher than that of the

second silicon nitride film.

42. A manufacturing process of a semiconductor device according to claim 40, wherein the first silicon nitride film is formed at 400°C or greater.

43. A semiconductor device, which comprises a first silicon nitride film for self alignment processing and a second silicon nitride film for passivation, wherein between an Si-H/Si-N bonds ratio R1 according to FT-IR analysis of the first silicon nitride film and an Si-H/Si-N bonds ratio R2 according to FT-IR analysis of the second silicon nitride film, there is a relationship of R1 < R2.

44. A semiconductor device according to claim 43, wherein the number of the Si-H bonds by the FT-IR analysis of the first silicon nitride film is 2×10^{21} cm^{-3} or less.